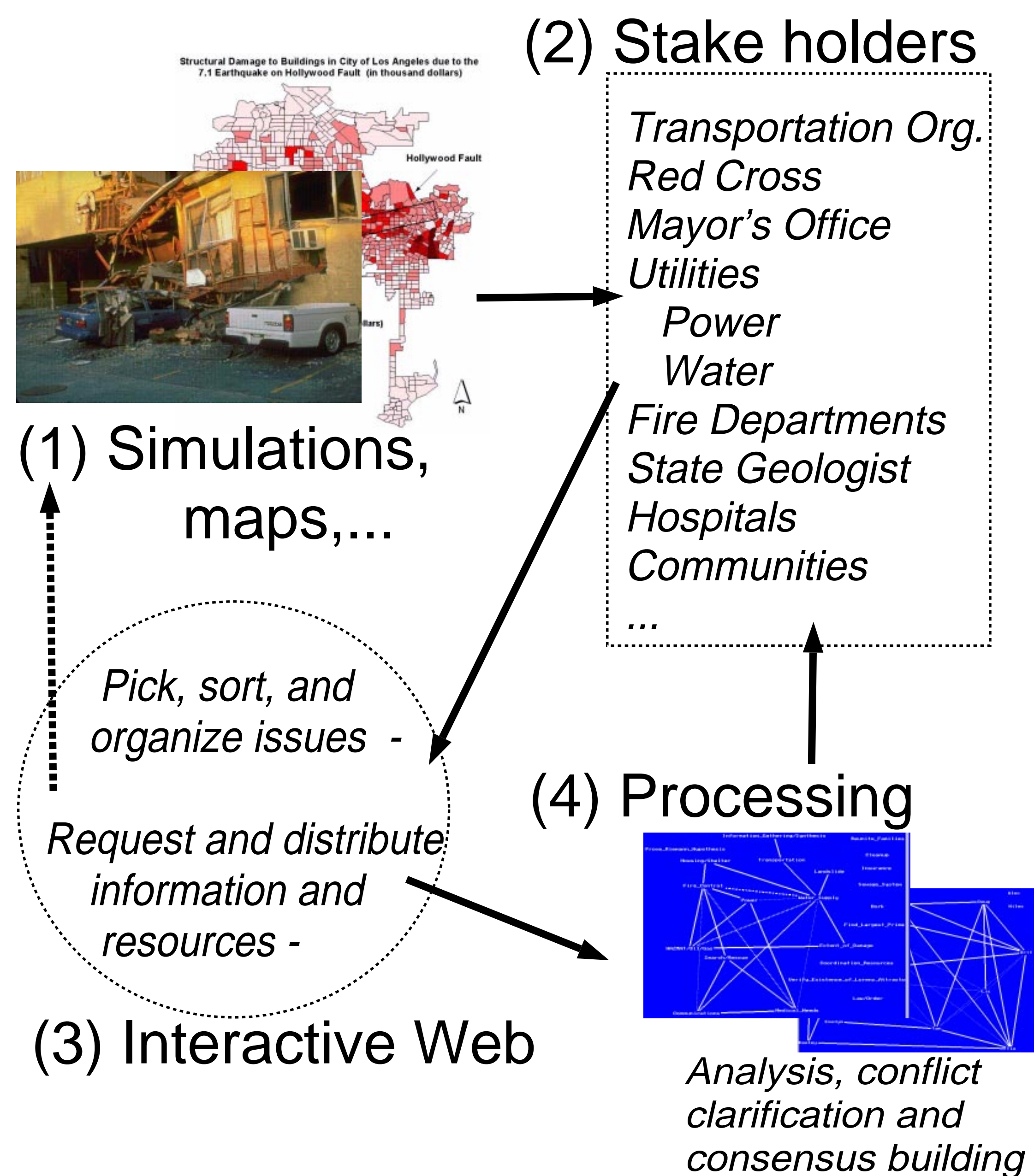
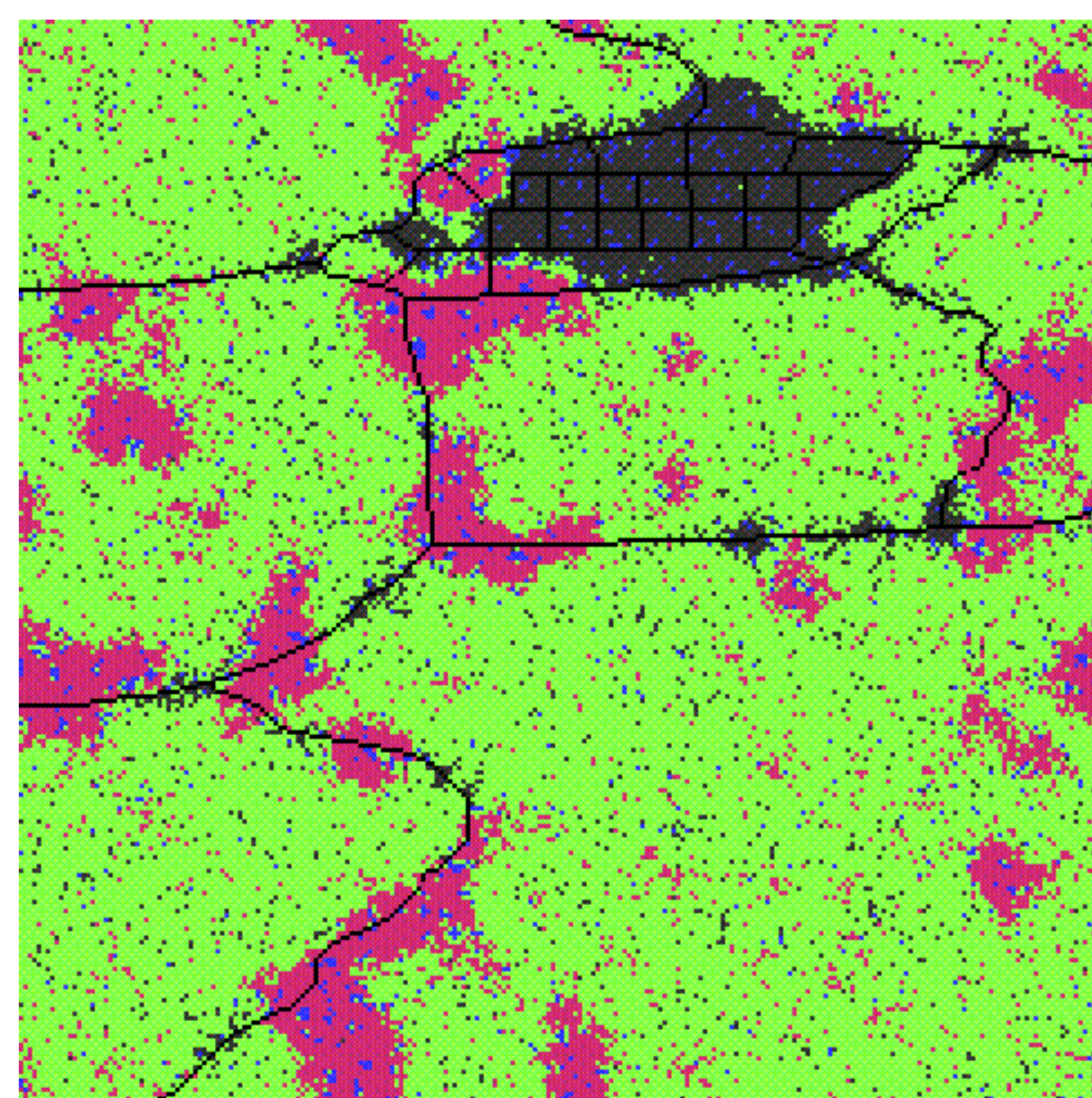
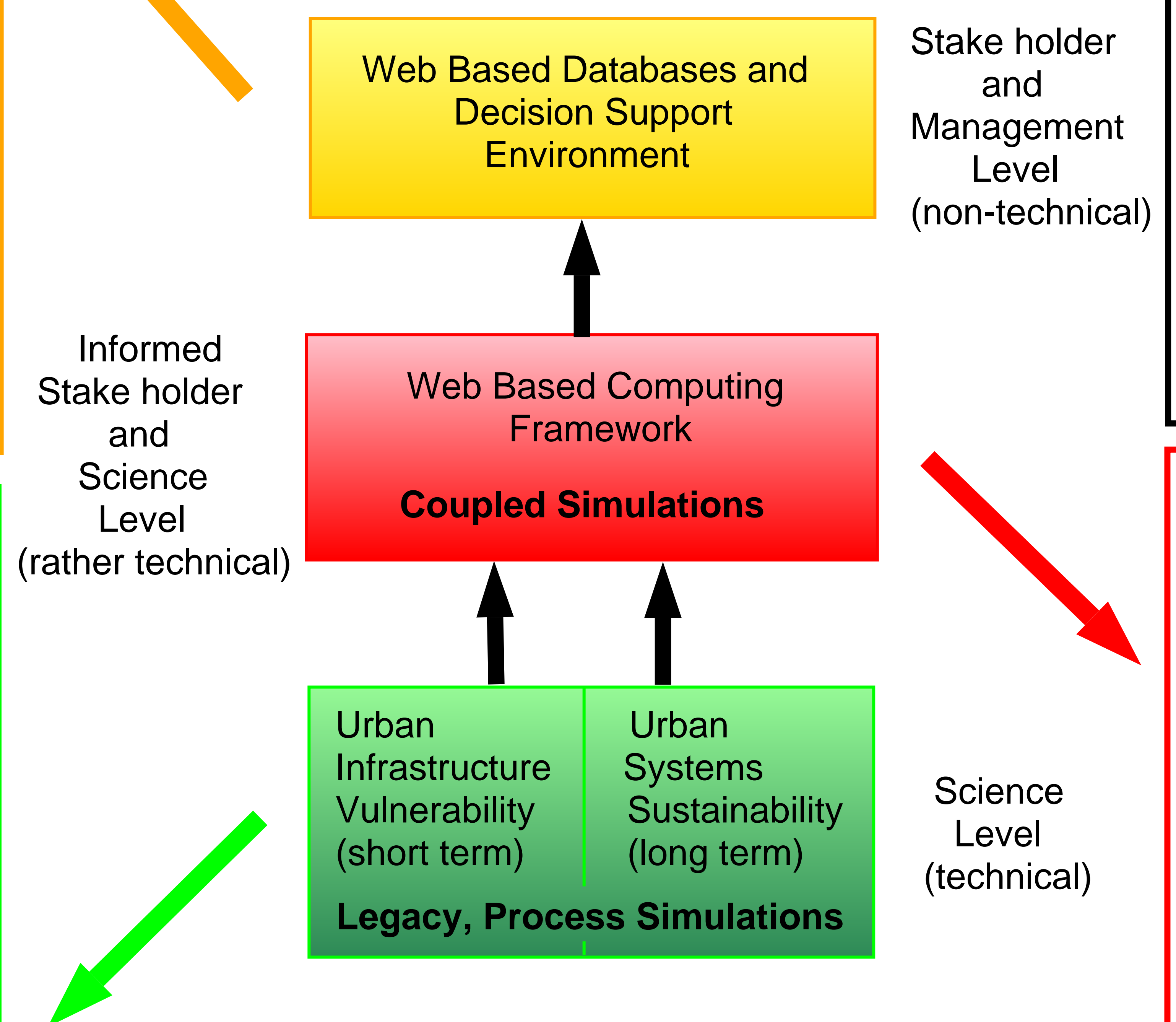


Enhance Collective Intelligence for Urban Disaster Planning

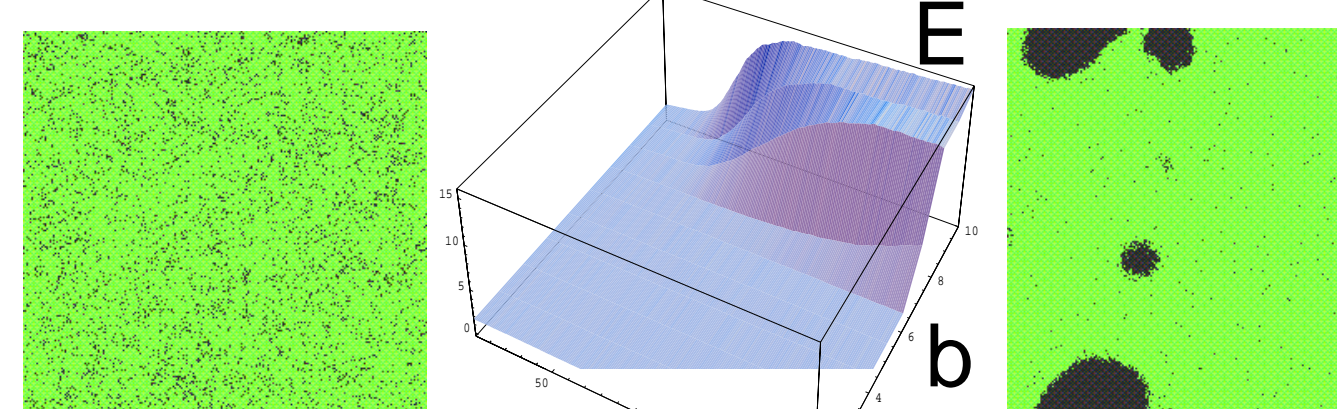
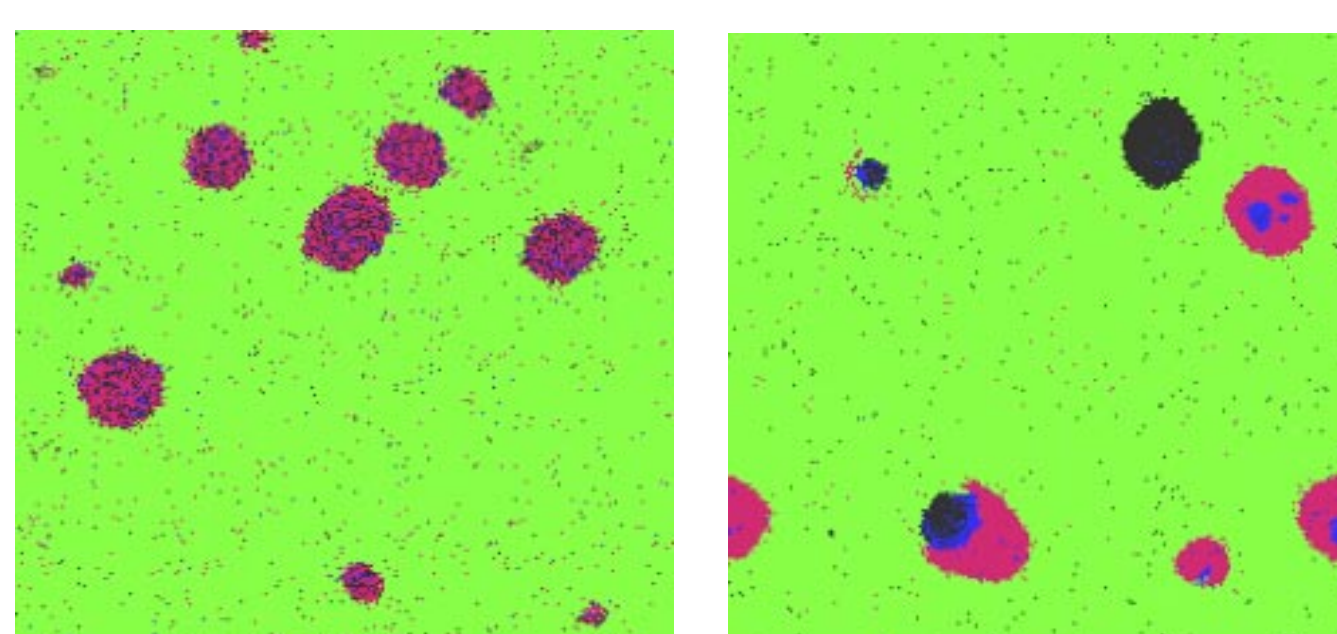
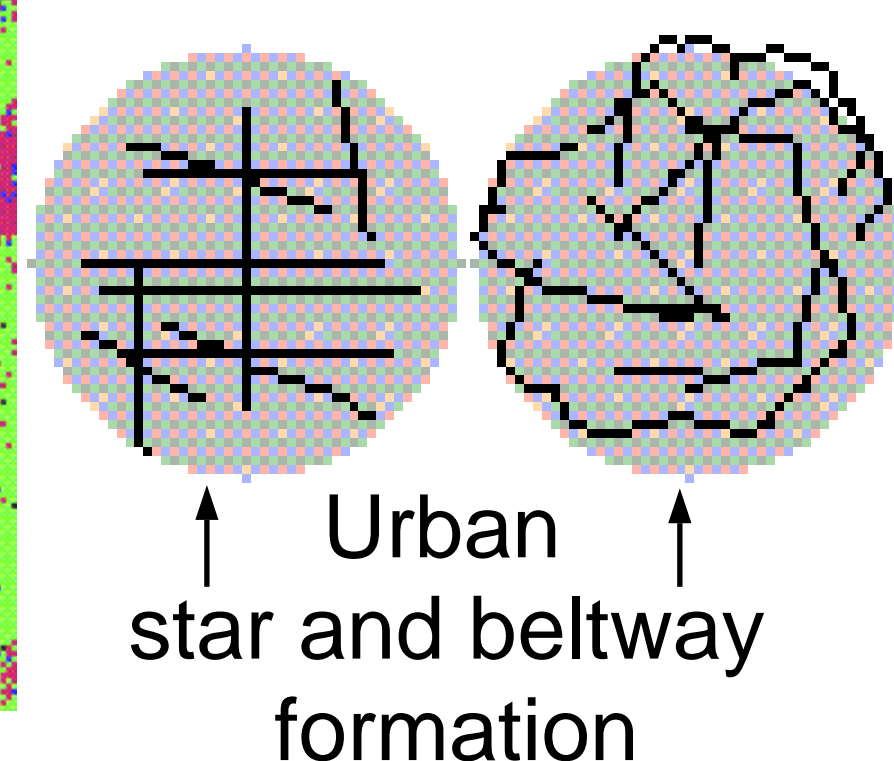


Disaster preparation involves a complex coordination between multiple stake holders and agencies with different priorities and action plans. Using the Internet technology a new kind of web environment can be used to facilitate consensus building and clarify conflicts when confronted with a particular (simulated) disaster scenario. The conceptual diagram of the web system shows: (1) reference information area, (2) stake holder information, (3) interactive area, and (4) data processing of the stake holder interactions. The results of stake holder input includes so called "mind maps" which depict the collective understanding of the problem complex under coordination. These virtual interactions are much faster, cheaper and in some ways also more efficient than traditional conferences and large committee meetings. However, the web can and should not eliminate real face to face meetings - only make them more efficient. 25 disaster management organizations are currently testing these web consensus methods in Los Angeles.

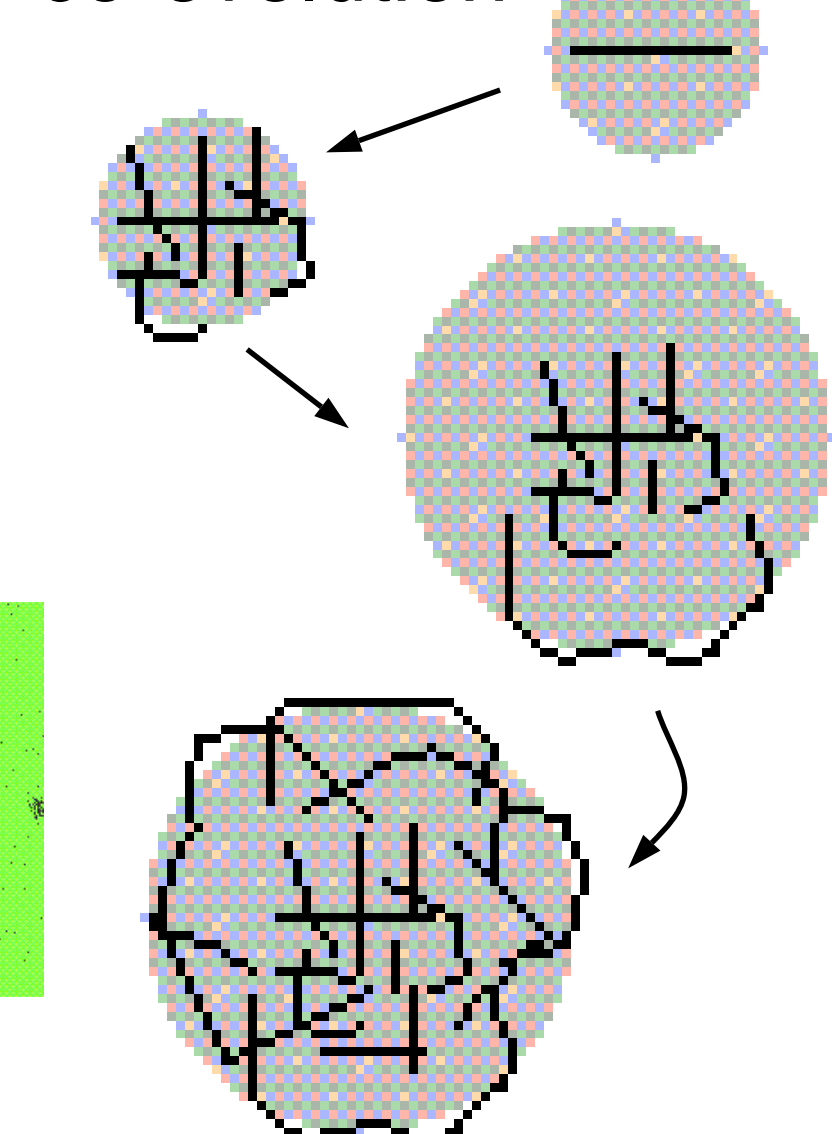
STRUCTURAL OVERVIEW - URBAN SECURITY



BASIC REGIONAL DYNAMICS



Settlement and road co-evolution



- non-urbanized
- commercial
- residential
- industrial
- (and in lower figures) urbanized

It is of interest to map out basic transitions in long term settlement patterns, in the way the main urban transportation arteries grow, and how build activities recover after disasters. For the settlement dynamics a Markov Random Field model with global selection criteria for land use changes is used. The road growing dynamics is based on a local transportation "diffusion" assumption and connection of a non-local transportation potential.

Transitions shown: From mixed activities to a split of housing, commercial and industry; "Condensation" of build; Beltway to star formed urban road system; Road and settlement co-evolution.

To understand the system performance of the electrical network after an earthquake, several different models, simulations, and GIS data have to be integrated:

- (i) Simulated ground motion parameters for the earthquake scenario;
- (ii) Combine ground motions with component fragilities;
- (iii) Combine damaged state probabilities with electrical power systems performance;
- (iv) Combine knowledge of the immediate black out areas to simulate secondary effects on the regional grid. On each step of the way GIS is a necessary part of the analysis.

Coupled simulations show the consequences of a scenario earthquake of Richter scale magnituded 6.75 on the Elysian Park fault under downtown Los Angeles.

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URBAN SECURITY

ies, regardless of size, have a set of complex set of interrelated problems
iated with safety, sustainability, growth, the economy, infrastructure
aince, the environment, and quality of life. The infrastructure components
ity - for example, the electrical power grid, the water supply, transportation,
he food and goods distribution - are intimately linked to one another and
rone to disruption due to natural or human hazards or overutilization and
/. A detailed understanding of how cities function is vital for assessing
vulnerabilities, responding to crisis situations, and planning for sustainable
h and infastructure development. The traditional approach for making
assessments, either by modeling the individual sub-systems or by linking
/ simplified models, is inadequate to describe the complex dynamics of
. The Urban Security initiative at Los Alamos is in the process of building
oratory competency in which state-of-the-art urban infrastructure and
onmental models, simulations, and GIS data are being integrated across
lines.

shown here and point of contact(*):
"ancement of collective intellignece for urban disaster management"
a Mahashwari, Rutgers University, sudha@eden.rutgers.edu
ais O'Calloghan, Princestopn University, aindraais@cs.princeton.edu
n Rasmussen, EES-5, LANL, steen@lanl.gov (*)
in settlement dynamics and road evolution"
s Andersson, Chalmers University of Technology, claesand@fy.chalmers.se
al Yamins, Princeton University, yamins@fas.harvard.edu
r White, Memorial University, roger@morgan.uccs.mun.ca.
l Fogel, Boston University, fogel@crsa.bu.edu
n Rasmussen, EES-5, LANL steen@lanl.gov (*)
hquake and infrastructure"
a Mahashwari, Rutgers University, sudha@eden.rutgers.edu
han Dowell, TSA-4, LANL, ljdowell@lanl.gov (*)

ral reference to the Urban Security project:
/www.ees5.lanl.gov/Urban_Security/FY99/#activities - or -
an, mbrown, dgeorge, gav, steen] @lanl.gov

EARTHQUAKES AND INFRASTRUCTURE

